Report No. 75-1-13

March 1975
5230

EVALUATION OF SOUTHERN PINE BEETLE OUTBREAK ON THE PISGAH AND NANTAHALA NATIONAL FORESTS, NORTH CAROLINA

By

J. D. Ward

INTRODUCTION

An aerial and ground evaluation of southern pine beetle infestations was conducted on five districts of the Pisgah and Nantahala National Forests during November and December 1974 by the Asheville Office of Forest Pest Management. The infestations on these districts are part of a Southwide outbreak involving approximately 50 million acres in 11 states. Southern pine beetle suppression projects have been active for several years on all districts except the French Broad District which had little problem with the beetle until 1974. The Tusquitee and Wayah Districts have had problems with the beetle since 1967 (Rauschenberger and Bell, 1967). Infestations were detected on the Grandfather District in 1972 (Barry, et al, 1973) and the Pisgah District in 1972 (Ward, et al, 1973).

METHODS

An aerial survey was performed over each district using either the aerial sketchmap or aerial photographic method.[1,2/] A portion of the spots detected from the aerial surveys were ground checked to confirm the cause of mortality and to assess the general condition of the beetle population on each district.

1/ Evaluating Southern Pine Beetle Infestations, 1970, USDA, USFS, SA, S&PF, Div. of FPM, Pub. FPM-8, Atlanta, Ga. 35 pp.

2/ Detection of Forest Pests in the Southeast, 1970, USDA, USFS, SA, S&PF, Div. of FPM, Pub. S&PF-7, Atlanta, Ga. 51 pp.

RESULTS AND DISCUSSION

Results of the evaluations showed a high level of infestation on the five districts surveyed (Table 1). Infestations were found throughout the pine type on these districts; however, there were areas where beetle activity was more severe (Figures 1 and 2). Infestations ranged in size from one tree to three thousand trees. The larger spots were found in mountainous areas that were inaccessible for suppression. It appears that the outbreak will continue in 1975 since neither natural enemies of the beetle nor adverse winter weather are significantly affecting the southern pine beetle populations.

RECOMMENDATIONS

Where timber resources can justify suppression measures, the districts should continue to follow guidelines outlined in the 5250 section of the Forest Service Manual which are as follows:

1. Removal of Infested Trees by Commercial Sale or Administrative Use. When infested trees of merchantable size are accessible, they should be removed by commercial sale or administrative use procedures. Logging of the infested material should begin immediately. Contract time limits should insure rapid removal.

   Where practical, and if host type is present, a 40- to 70-foot buffer strip should be marked and cut adjacent to and ahead of the most recently infested trees. This practice is effective in reducing the possibility of "breakouts." When only a small volume of infested merchantable material occurs in a spot, non-infested trees surrounding the spot may be marked to provide an operable cut.

   The order of priority for removing beetle infested timber from a spot should be as follows:

   Trees having nearly developed broods (usually the red and fading trees).

   Trees having young broods (usually the green, recently infested trees).

   Trees in the buffer zone.

2. Piling and Burning. Unmerchantable or inaccessible southern pine beetle infestations can be suppressed by cutting, piling, and thoroughly burning the bark of infested trees. The entire bark surface must be thoroughly burned to insure effective control. The order of priority for cutting, piling, and burning infested

trees, particularly the large spots, is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the piling and burning operation.

3. Chemical Control. Chemical formulation recommended for southern pine beetle control is a 1/2 percent Lindane spray with No. 2 fuel oil as the carrier. This may be formulated from a 20 percent lindane emulsifiable concentrate or oil concentrate at the rate of 11 pints of concentrate in enough fuel oil to make 55 gallons of spray. (Ratio of one part 20 percent lindane EC to 39 parts No. 2 diesel fuel).

   Cut, limb, and buck all infested trees into workable lengths. Spray the infested bark surface to the point of run-off. A compressed air sprayer (3-gallon capacity or equivalent) is an ideal applicator. Infested logs must be turned two or three times to insure complete treatment of infested bark. Spray stumps and bark removed by woodpeckers. Low pressure sprayers may be used to treat large, accessible infestations.

   The order of priority for cutting and spraying infested trees in large spots is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the chemical control operation.

   Never spray trees from which southern pine beetle brood has emerged. Natural enemies of the southern pine beetle in these trees can then complete their development. To prevent aerial spotters from mapping treated spots, cut trees with red needles from which beetles have emerged.

   Instructions for minimizing the adverse effects of mixing, transporting and storing pesticides, applying pesticides and disposing of pesticide containers and excess chemicals are outlined in section 8.3 of the Forest Service Health and Safety Code and FSM 5242.21. Detailed safety procedures should be outlined in the project suppression plan.

4. Reexamination of Treated Areas. Reexamine areas where infested trees were removed by commercial sales, piled and burned, or chemically treated within two or three weeks after treatment to check for additional infested trees. If additional trees are found, treat them.

PRECAUTIONARY PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key—out of the reach of children and animals--away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

NOTE: Some states have restrictions on the use of certain pesticides. Check your state and local regulations. Also, because registrations of pesticides are under constant review by the U. S. Department of Agriculture, consult your county agricultural agent or state extension specialist to be sure the intended use is still registered.

Table 1. Summary of aerial and ground evaluations of southern pine beetle infestation on the Pisgah and Nantahala National Forests, North Carolina, December 1974.

1. AERIAL SURVEY DATA					
Ownership Unit	Grandfather R.D.	Wayah R.D.	French Broad R.D.	Tusquitee R.D.	Pisgah R.D. & Bent Cr. Exp. Forest
Date of survey	10/23/74	11/26/74	11/22/74	11/26/74	9/23/74
Survey type and pct.coverage	Photo-18%	Sketch-100%	Sketch-100%	Sketch-100%	Photo-15%
Acreage surveyed	103,700	390,200	196,658	406,527	94,666
Estimated host type	23,575	18,250	13,500	64,880	22,727
Number of spots in survey area	715	235	162	392	147
2. GROUND TRUTH DATA					
Date of ground checks	11/13/74	12/17/74	12/9/74	12/11/74	11/10/74
Number of spots checked	6	7	6	10	8
Number of active spots	6	7	6	9	7
Mean no. infested/spot	470	45	1,043	52	233
Brood density-beetles/ft^2 of bark surface	355	444	445	265	--
3. ESTIMATED INFESTATION LEVEL					
Infested trees per M acres of host type	5,498	263	3,399	571	887
Number of infested trees in survey area	129,622	4,801	45,888	37,049	20,149
Volume of recently killed trees	918,842 cu.ft.	36,353 cu.ft.	288,026 cu.ft.	362,030 cu.ft.	321,488 cu.ft
Number of spots per M acres of host type	30	13	12	6	6
Range of spot size (trees)	1-3000	1-1000	4-2000	1-1000	1-1500

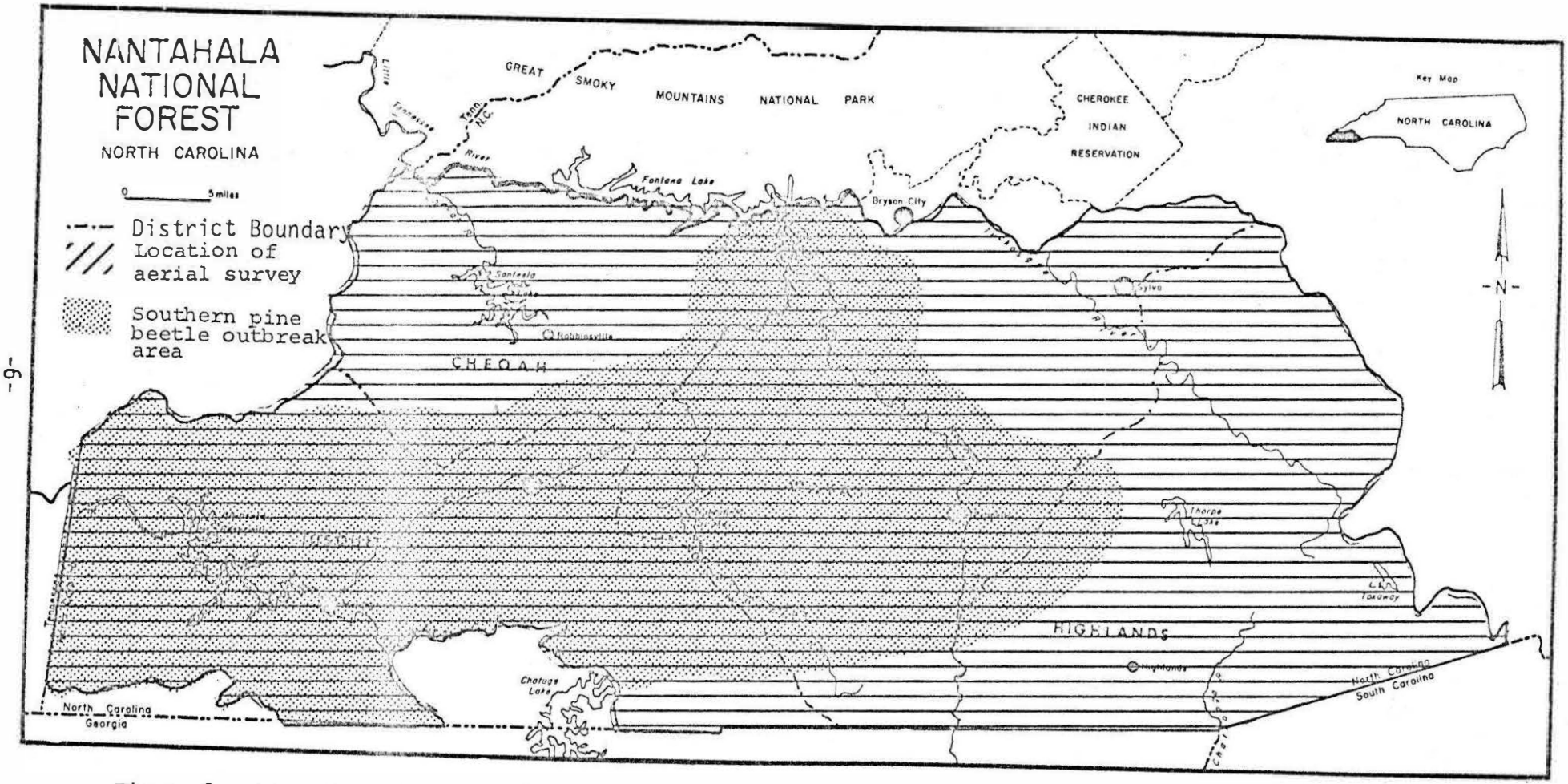

Figure 1. Location of southern pine beetle outbreak, Nantahala National Forest, N. C., December 1974.

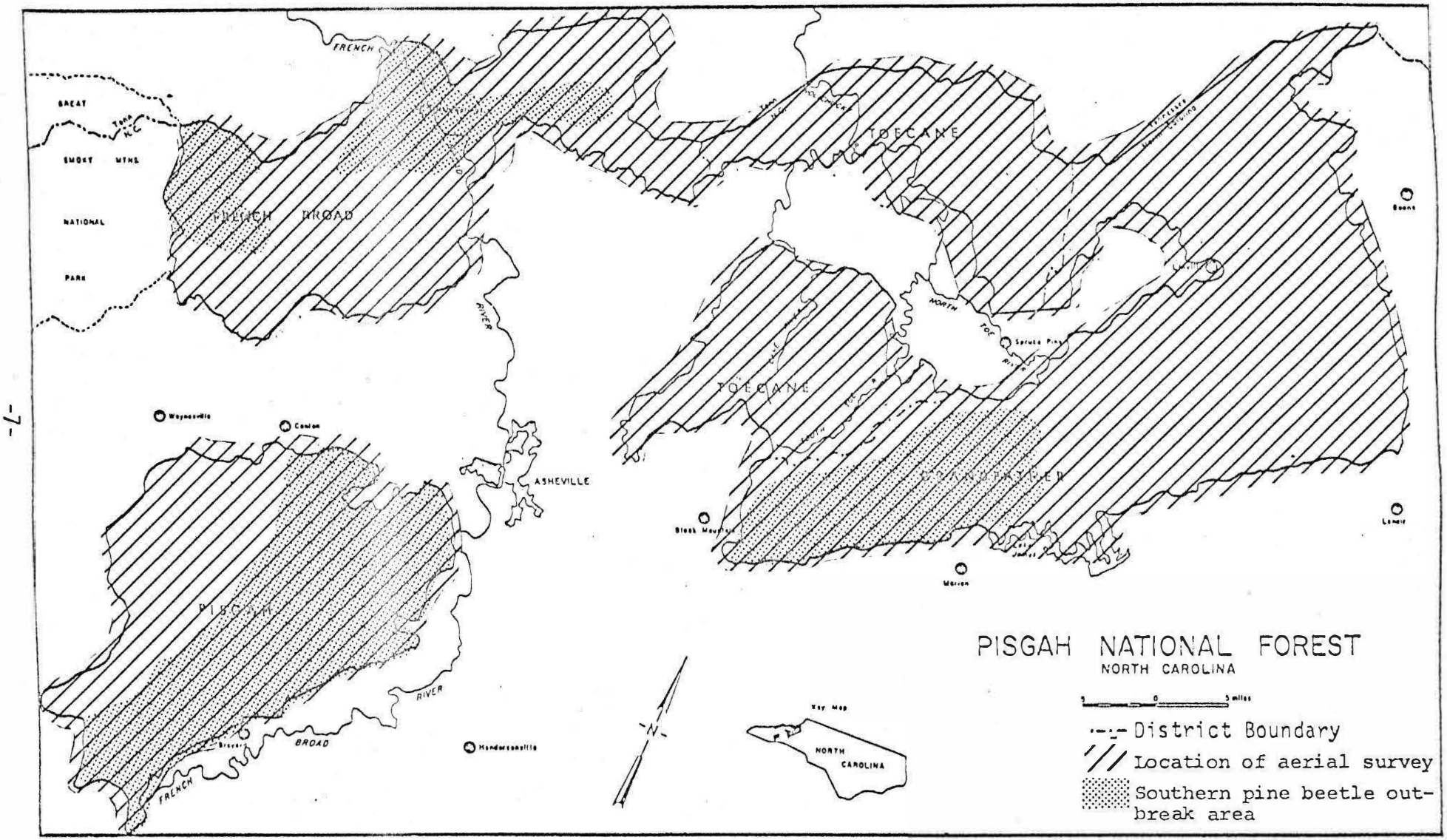

Figure 2. Location of southern pine beetle outbreak, Pisgah National Forest, N. C., December 1974.

REFERENCES

Barry, P. J., J. D. Ward, and W. E. McDowell. 1973. Evaluation of southern pine beetle infestations on the Grandfather Ranger District, Pisgah National Forest, N. C. USDA, USFS, SA, S&PF, FPM-Asheville Report 73-1-24.

Rauschenberger, J. L. and J. C. Bell. 1967. Detection and evaluation of southern pine beetle infestations on the Nantahala National Forest, N. C. USDA, USFS, SA, S&PF, FPM-Asheville Report 68-1-15.

Ward, J. D., W. E. McDowell and E. T. Wilson. 1973. Evaluation of southern pine beetle infestations on the Pisgah District, Pisgah National Forest, N. C. USDA, USFS, SA, S&PF, FPM-Asheville Report 73-1-25.